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Imagery analysis report

**SA-11 Tactical Defensive SAM System
Test Program, Emba Missile Test Center
USSR**

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25X1**SA-11 TACTICAL DEFENSIVE SAM SYSTEM TEST PROGRAM,
EMBA MISSILE TEST CENTER, USSR [REDACTED]**

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SUMMARY

1. [REDACTED] Extensive analysis of the SA-11 research and development program at the Emba Missile Test Center [REDACTED] in the USSR revealed that the complete SA-11 system,* as of February 1980, was not yet ready for deployment. Based on the observation of specific pieces of equipment and the use of test and training facilities, it appears that the SA-11 system is being developed along two separate lines and deployed in two distinct phases. One design line resulted in an interim enhancement of the older SA-6 GAINFUL missile system, and the other will produce an improved follow-on to replace the SA-6 system. The initial phase used only the three-missile SA-11 transporter-erector-launcher-and-radar (TELAR; Figure 1) with either the SA-6 GAINFUL missile, modified SA-6 GAINFUL missile, or the SA-11 missile (9M-38).¹ During this phase, the TELAR was deployed into existing SA-6 regiments resulting in a mixed SA-6/-11 regiment. The first phase of SA-11 development was achieved in December 1979 when the three-missile SA-11 TELAR was deployed to the SA-6 regiment housed at Leninakan Army Barracks North AL 3 [REDACTED]. In the later phase, the four-missile SA-11 TELAR (Figure 2), the SA-11 missile, the EM-EL-03 radar, and unique support equipment designed for the SA-11 system will be deployed to form a pure SA-11 regiment. It will probably be in the 1982-1983 timeframe before this latter deployment occurs.

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DESCRIPTION**Development of the SA-11 System**

2. [REDACTED] Work was begun on the design of the three- and four-missile versions of the SA-11 as early as June 1972; however, major emphasis was placed on the three-missile version at that time.¹ By April 1973, a prototype of the three-missile TELAR had been produced.¹ The first observation of the three-missile TELAR at launch area A of the Emba Missile Test Center occurred during 1974. Due to the developmental emphasis on the three-missile TELAR, work was not started on the four-missile TELAR until 1975.¹ The four-missile TELAR was not observed in launch area A [REDACTED] when it was seen at pad A-2, the primary research and development pad for the SA-11 TELAR. From 1974 until late 1976, a three-missile TELAR in several different developmental models was tested at pad A-2. From [REDACTED] pad A-2 was vacant. During this period, the four-missile TELAR was initially brought to Emba for testing. This five-month period may represent a break in the SA-11 system development program, when emphasis was shifted from the three-missile TELAR to the four-missile TELAR and its support equipment.

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3. [REDACTED] In the months preceding and subsequent to the first sighting of the four-missile TELAR, a number of other events occurred at Emba which can be linked to the start of testing of the four-missile TELAR. These events, which are related to the developmental testing of the four-missile SA-11 TELAR included the following.

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Date	Event
April 1976	First sighting of SA-11 calibration vehicle
October 1976	First sighting of SA-11 probable command vehicle
February 1977	First sighting of four-missile SA-11 TELAR
March 1977	First sighting of SA-11 probable resupply vehicle
June 1977	First sighting of SA-11 transloader
July 1977	Start of construction for two concrete hardstands in launch area A; these hardstands were later associated with the SA-11 transloader and SA-11 probable command vehicles
October 1977	First sighting of two EM-EL-03 acquisition radars
November 1977	Three-missile SA-11 TELAR moved to Emba Missile Test Center Operations Support Area [REDACTED] to begin initial troop familiarization/training

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4. [REDACTED] The equipment listed in the above table is being developed as support and radar equipment for the four-missile TELAR. The early arrival of the SA-11 calibration vehicle, replacing a gun carriage-mounted calibration antenna, occurred because the onboard radars for both the three- and four-missile TELARs are probably the same.¹ The SA-11 calibration vehicle can probably be utilized by both TELARs.

5. [REDACTED] After November 1977, while the four-missile TELAR remained at pad A-2 for testing, the three-missile TELAR was seen in increasing numbers and frequency engaged in troop familiarization and training exercises at the SA-6 system training and checkout area in the operations support area. Troop

*The final design configuration of the SA-11 system includes a four-missile SA-11 TELAR carrying SA-11 missiles, the EM-EL-03 acquisition radar, and three pieces of unique SA-11 support equipment.

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training in the operations support area and field exercises at adjacent SAM training areas from January to August 1979 indicated that the three-missile SA-11 TELAR was being integrated with the SA-6 system as a mixed SA-6/-11 regiment. This regiment consisted of five batteries containing three SA-6 transporter-erector-launchers (TELs), one three-rail SA-11 TELAR, and one STRAIGHT FLUSH tracking and guidance radar per battery. Also, support equipment organic to the SA-6 system was used in these exercises. This included the SA-6 service transloader, the SA-6 canister transporter, and the SA-6 command and control vehicle. Acquisition radars such as the THIN SKIN, LONG TRACK, SPOON REST, and FLAT FACE, which are used with tactical SAM regiments, were also present.

6. [REDACTED] The first phase of SA-11 development was completed in December 1979 with the deployment of the three-missile TELAR to the SA-6 regiment housed at Leninakan Army barracks North AL 3. A second mixed SA-6/-11 regiment was deployed to Sary-Ozek Army Barracks AL 1/Headquarters Motorized Rifle Division [REDACTED]

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Second-Phase Development of the SA-11 System

7. [REDACTED] The four-missile SA-11 TELAR and associated support equipment was first observed in 1977, indicating that the research and developmental testing of this equipment was approximately three years behind that of the three-missile SA-11 TELAR. Thus, the second phase of the SA-11 system deployment will probably not occur until the 1982-1983 timeframe. The following additional information supports the concept of a 1982-1983 deployment date for the SA-11 system. The average timeframe from design stage to deployment for Soviet tactical defensive SAM (SA-4, SA-6, and SA-8) systems has been seven years. The SA-11 TELAR was developed within this average timeframe; the design phase for the three-missile SA-11 TELAR began in 1972 and the prototype was completed in 1973. Since emphasis on design work for the four-missile SA-11 TELAR did not begin until 1975, 1982 is probably the earliest deployment date that can be expected if the average seven-year development time is maintained. Historically, deployment of the SA-4, SA-6, and SA-11 three-missile SAM systems occurred from 16 to 24 months after a TEL/TELAR for that system was removed from the launch complex and moved to the operations support area for initial troop familiarization. The three-missile SA-11 TELAR was tested for three to four years in launch area A before it was moved to the operations support area for initial troop familiarization/training. If development time for the four-missile SA-11 TELAR in launch area A is consistent with the three-missile SA-11 TELAR, it would not be ready to start troop training and/or field exercises in the operations support area until 1980. Assuming that there will be 16 to 24 months of troop training and/or field exercises for the four-missile SA-11 TELAR, no deployment prior to 1982 could be expected.

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8. [REDACTED] As of February 1980, the four-missile TELAR was probably not ready to be moved to the operations support area. Its almost continuous presence at pad A-2 since 1977 indicates that the four-missile TELAR is probably still undergoing developmental testing. Only one, or possibly two, four-missile SA-11 TELARs have been seen with the second possible four-missile TELAR first observed in launch area A during 1979. The presence of no more than two four-missile TELARs, only one SA-11 transloader, one SA-11 probable command vehicle, one probable SA-11 resupply vehicle, and two EM-EL-03 radars strongly suggests that the four-missile SA-11 system is not ready for field exercises. In contrast, during the field exercises for the three-missile SA-11 TELAR in 1979, at least nine three-missile TELARs were present at Emba. As many as 20* four-missile TELARs would be needed to conduct a pure SA-11 regimental exercise.

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9. [REDACTED] The previous analysis could not be made until a method for differentiating the three-missile SA-11 TELAR from the four-missile TELAR was developed. The three-missile TELAR has a missile launch rack similar to the SA-6, with three rails to support the missiles. The four-missile TELAR probably has four small missile mounts or short rails that appear to be capable of independent elevation.

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Types of Missiles Associated with Three- and Four-Missile SA-11 TELARs

10. [REDACTED] An intelligence gap exists in the knowledge of what type of missile will be deployed with the three- and four-missile SA-11 TELARs. There are three candidate missiles that may be used with the two SA-11 TELARs—the SA-6 GAINFUL missile, a modified SA-6 GAINFUL missile, and the SA-11 missile. [REDACTED]

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[REDACTED] SA-11 four-missile TELARs have only been seen with SA-11 missiles in launch area A during the past four years, while the three-missile SA-11 TELAR has been seen with the SA-6 GAINFUL and the SA-11 missile. Confirmation of the missile type on the three-missile TELAR in training exercises at Emba or after deployment at Leninakan or Sary-Ozek, however, has not yet been made.

*The last three Soviet tactical SAM systems deployed (SA-6, SA-8, and mixed SA-6/-11) each had 20 TELs/TELARs in a regiment.

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